

Homemade Instruments and the Science of Sound Residency

Residency lesson for session 1 of 5 by Rachel Sumner

Teaching Artist (TA): Rachel Sumner, **Grade:** 2nd and 3rd, 50 minutes

Prior to this visit, teachers will have taught a curriculum lesson on sound and vibration.

1. Introduction to woodwind instruments, pitch, review sound (8-10 minutes)

Objectives: TLW access prior knowledge about sound and woodwind instruments by observation, questions, discussion and by identifying the musical instrument family of instruments brought in by TA. TLW imitate the sound the turkey baster plays with his or her voice. TLW use a body part to show the movement of the pitch. TLW make a prediction about the pitch of a shorter straw.

Assessments: General assessment of prior knowledge. The TA will listen & observe the learners as they imitate and demonstrate what is happening with the pitch of the turkey baster. Take a vote (raise hands): Who thinks the pitch will be higher? Lower? The same?

a.) TA will play recorder. (open-ended tube) **Question:** Can anyone tell me which instrument family it belongs to and why? (Woodwind Family) Discuss the properties of woodwind instruments. Can anyone give us an example of another woodwind instrument? After we have an example: Show a picture of woodwind instruments. Also, look at brass.

Question: Tell me what you know about sound, what is it? All things that make a sound have one thing in common—they make the air shake back and forth very fast. These shaking movements are called vibrations. If the vibrations reach our ears, we “hear” the sound. A recorder vibrates the air and those vibrations travel from the recorder through the air until they reach us. But we don't hear a recorder with our noses or our elbows! These vibrations need to travel into our ears for us to really hear them. Vibrations can travel through gases, liquids or solids. Woodwind and brass instruments make sound from the vibration of air inside a tube.



b.) TA will play the turkey baster (closed-end tube). **Question:** Can anyone tell me how this instrument makes sound? (Vibration of the column of air inside a tube) Listen and imitate with their voices the glissandos played on the turkey baster by the TA. *See if anyone uses the body to show the changes in pitch. If so, point it out. If not, ask them to use on arm to show what is happening with the pitch.*

Question: What do you notice about the sound? Discuss and define pitch. Listen to different pitches and note how much air is inside the tube. The column of air inside the pipe (or tube) is vibrating. The less air in the tube the higher the pitch. This happens because sound waves can travel, or vibrate, a short distance faster than a long distance.

c.) TA will play a long straw. **Question:** What instrument family? (Woodwind) How is the sound produced? (By vibrating air inside a closed-ended tube.) Play the straw again and ask them to sing the note or pitch it plays. **Question:** Make a prediction about the shorter straw from what we learned about the turkey baster, the air inside a tube, and pitch. Vote. Play the longer straw, sing the note. Then play the shorter straw and sing. (The pitch will be higher.) Why? (Sound waves can travel, or vibrate, a short distance faster than a long distance. The air inside the tube is vibrating. When air vibrates up and down the tube at a faster rate, the sound will have a higher pitch.)

2. Demonstration on how to make a straw panpipe.

(5 minutes) Today you will make your own wind instrument out of straws! Gather all students around a table or a group of desks. I will use a student partner with me to demonstrate how to make a panpipe.



Materials needed for Straw Panpipe with spacer

straws: 2 plastic straws per person, masking tape & pen, scissors (that are sharp enough to cut straws), 2 pea shaped pieces of modeling clay each

3. Students make their panpipes. (10 minutes) *Teacher and TA roam to assist if needed.*

Objective: TLW will use a ruler to measure & cut 2 straws assigned lengths. One straw will be longer than the other.

Assessment: The TA and Teacher will observe the length of straws when complete. TA will listen to the pitch to determine if they are in tune.

4. Panpipe Lesson and Practice (10 minutes)



I will give students a short lesson with tips on how to play. I will let students know that the reason we are doing panpipe first is because sometimes it takes a little practice to learn to play it. They will practice trying to get sound. We will ask those who get the sound to share tips and help others.

5. Some learners will play ostinati on panpipe while others sing (8 minutes)

Objective: TLW play both notes of the ostinato and alternate between the high and low pitch with the appropriate rhythm pattern. **Assessment:** TA will observe students playing and create a rubric.

*** WHAT DID WE LEARN TODAY? Reflection (3-5 minutes)**

• **YOUR GOLDEN PASS OUT OF CLASS (2-3 minutes)** Write your name on the card and which instrument you think can play the lowest pitch? A flute, clarinet, or an English horn. (Pictures will be posted on the board with the correct spelling.)

Hand your golden pass to me on your way out the door!